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Correction of the Nasal Deformities Associated with the Unilateral Cleft lip

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Introduction

The present authors would like to present a method of correcting nasal deformities associated with unilateral cleft lip. Nasal correction is divided into two procedures, primary and secondary. During the primary correction some surgeons limit work on the nose to closing the cleft lip and rotating the alar base into normal position. However, in the secondary correction, there are two procedures for the subcutaneous undermining of the alar dome. One is to make an incision at the alar base and to continue it as far toward the columellar base as possible, this incision is then met by another incision begun at the columellar base thereby completely undermining the alar dome. Another method is to approach the subcutaneous tissue of the alar dome through an external incision.

Primary nasal correction

The present authors reconstruct the nasal floor and rotation of the nose at the time of cleft lip closure (Fig. 1 a, b). The fallen alar dome is then pulled upward the root of the nose by a nylon

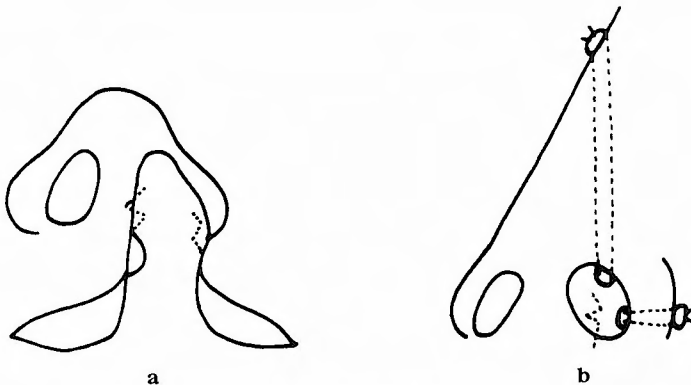


Fig. 1a. Illustration of closure of the alveolar cleft
b. As in McCOMB's method, the alar rim and dome on the cleft side are pulled upwards and attached to the root of the nose. This mattress suture is removed after 3 weeks

Key words: Unilateral cleft lip, Alar deformity, Septal deviation, Flying bird incision, Lifting method.

索引語: 片側唇裂, 鼻翼変形, 鼻中隔彎曲, 翼状切開, 挙上法.

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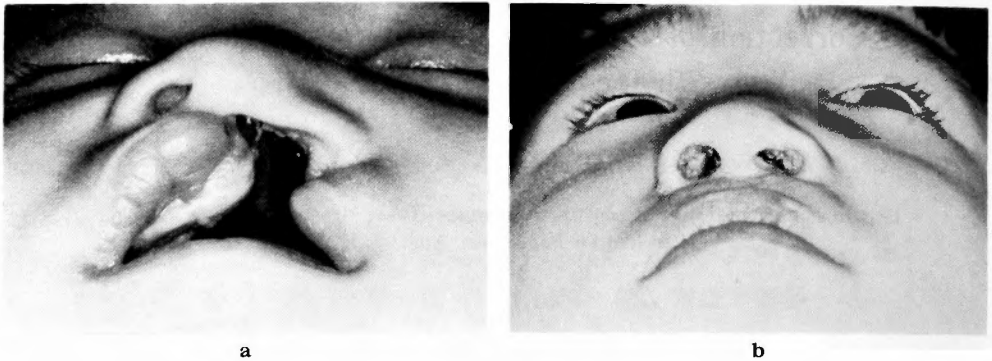


Fig. 2a. Unilateral cleft lip with a wide alveolar cleft, 3 months after birth. The nasal deformity was corrected at the time of the lip closure using McComb method
b. 2 years later

suture which runs to the root of the nose subcutaneously where it anchored with a mattress suture (McComb 1975). The mattress suture is removed after three weeks. This method is simple and leaves only slight scar formation around the nasal alar cartilage on the cleft side (Fig. 2 a, b). But, as the nasal alar cartilage can not be shifted to a anatomical position without undermining, this method often results in depression of the alar dome, alar rim and imbalance of the intercrural angle (Fig. 3 a, b). However, the present authors feel that any improvement made in the position of the alar dome by undermining during primary nasal correction will be lost as the patient grows.

Enlargement of the nostril floor and lateral displacement of the alar base becomes more noticeable within a few months after lip closure (Fig. 4 a, b, c, d). To limit the formation of scar tissue of the alar dome should be undermined during secondary correction when the patient is about 3 years old. In such cases enlargement of the nostril floor should be reduced to limit the degree of septal deviation before rhinoplasty is performed (Fig. 5 a, b, c). Reduction of the nostril floor and the realignment of M. Orbicularis oris may help prevent septal deviation.

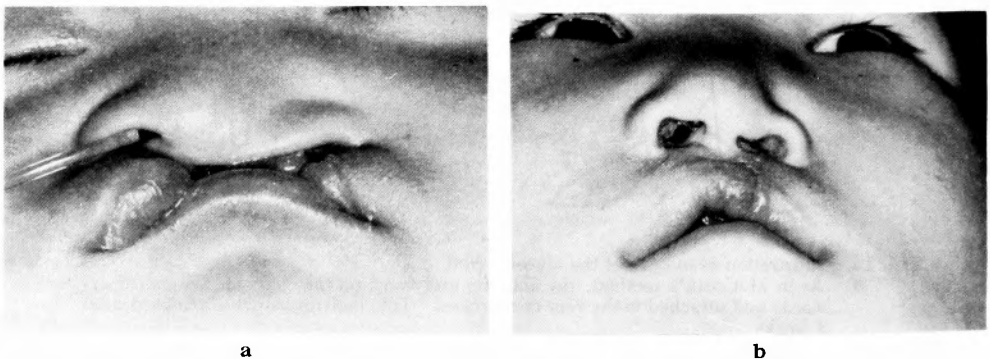


Fig. 3a. Unilateral cleft lip, 3 months after birth
b. 2 years after refine by McComb's method. The alar rim is depressed towards the nostril opening

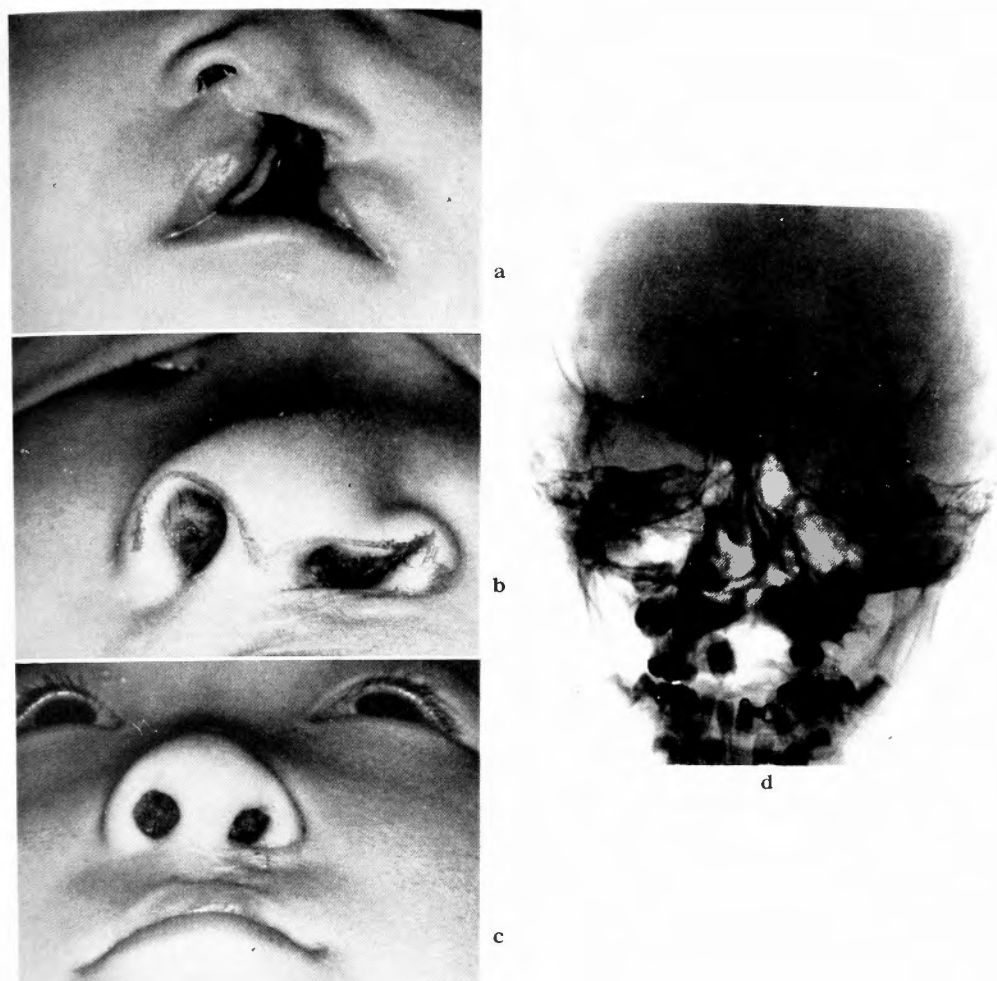


Fig. 4a. Unilateral cleft lip, 3 months after birth
b. 5 years later. McCOMB's method was used for the nasal deformity occurred postoperatively
c. 2 years after the lifting operation through a flying-bird approach
d. Septal deviation is still marked

Secondary nasal correction

From the point of view of physical development the proper time to perform secondary correction of deviation in the septal cartilage is between 3 and 15 years of age. We found that sometimes a certain degree of deviation of the nasal septum and the nasal bone is spontaneously corrected if the nostril floor has first been carefully reduced (Fig. 6 a, b, c, d).

Even though the nostril floor is first reduced in primary lip closure it is enlarged laterally with the growth of the patient and therefore must be reconstructed again during the secondary correction. Secondary correction is made by making two modified Z incision. The first runs from the alar base towards the medial crura, stopping in the middle of the nasal floor. The second

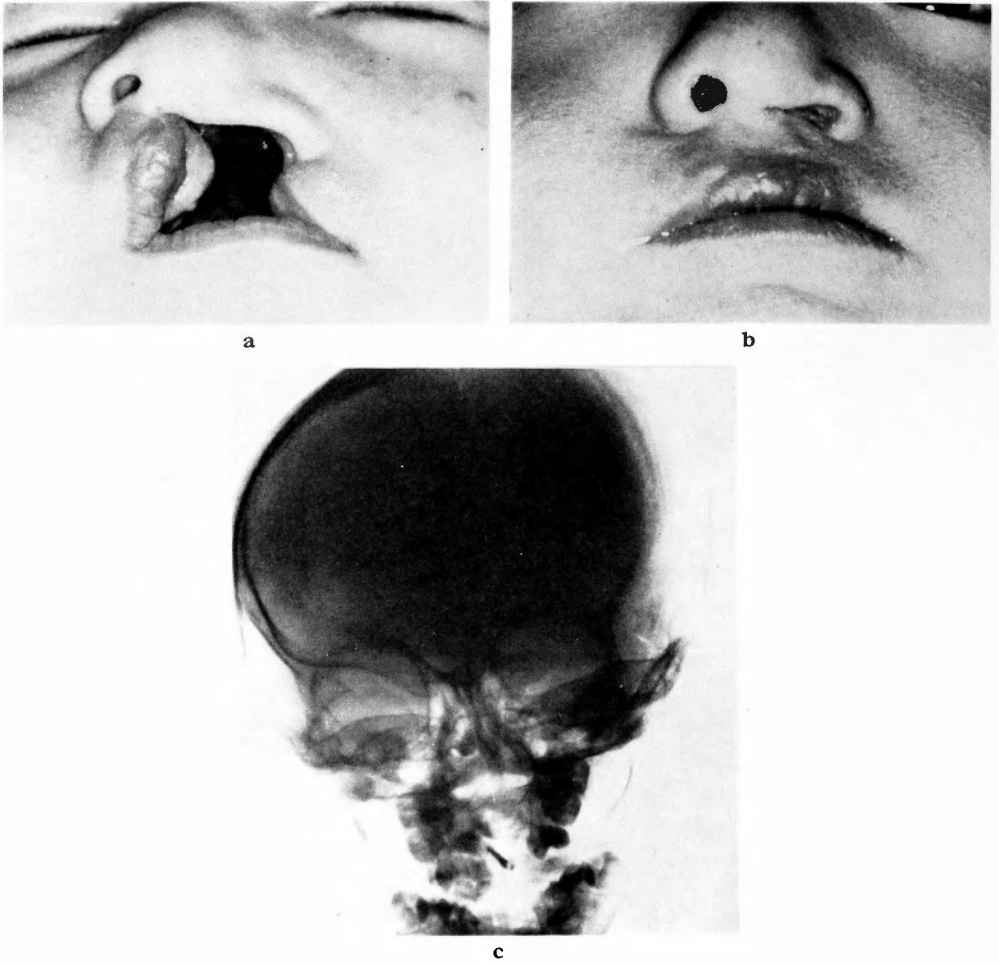


Fig. 5a. In cases in which the septal deviation is marked the nostril floor should be corrected before nasal reduction
b. 1 year after the lip closure and lifting of the alar dome
c. Septal deviation is marked

Z incision runs from the columellar base on the cleft side towards the lateral segment of the nostril floor stopping about 5 mm–1 cm after crossing the first Z incision. The columella, which was displaced towards the maxilla, is then undermined with scissors.

Next we suture the muscle under alar base on the cleft side to the muscle underlying the opposite columellar base. The columella is then lengthened by lifting it from its fallen position and secured in the correct position by suturing the mucosa and skin together in a Zig-Zag pattern coming down the nostril floor.

After the reduction of the nostril floor (about the age of 2) is completed, a flying bird incision is later made (about age 3–15) on the columella and alar rim to correct the displacement of the alar cartilage (Fig. 7 a, b, c, d, e, f). To correct the fallen alar dome the upper flap of the incision is



a



b



c

Fig. 6a. Nasal deformity after lip closure: 5 years of age
b. 4 years after reduction of the nostril floor
c. 8 years after the operation present in Figure 7



d

Fig. 6d. Septal deviation is slight

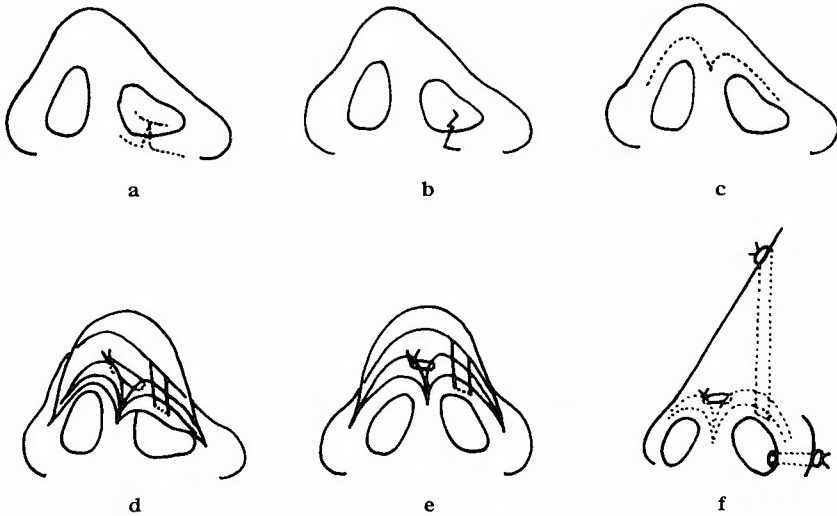


Fig. 7a. Illustration of modified Z-plasty on the nostril floor
b. Zig-Zag suture
c. Incision on the alar rim
d. Flap is turned up and the nylon suture is passed subcutaneously through the tissue at the inner margin of the alar rim
e. In another method of fixation of the alar, the threaded needle is passed through the perichordial layer on the untouched side to the perichondrial layer on the cleft side
f. "Pulling" suture is fixed to the root of the nose. The lateral mattress suture is also shown

then turned up and a nylon sutures is attached to the dermis of the inner rim of the alar cartilage and passed subcutaneously over the upper lateral cartilage towards the root of the nose where it is anchored with a mattress suture. After lifting the alar cartilage the threaded needle is passed from the perichordial layer of the lateral crura of the lower lateral cartilage on the cleft side to the corresponding perichondrial layer on the untouched side. This suture is then tied at the nasal tip. Using the above method we have found it is not necessary to wrap the suture around the



Fig. 8a. Nasal deformity after primary lip closure. 18 years of age
b. 1 year after secondary refine



Fig. 9a. Lip and nose deformities. 12 years of age
b. 1 year after secondary refine

entire lower or upper cartilage to lift the sunken ala, as recommended by STENSTRÖM and SPIRA.

If the deformity of the alar cartilage is more serious, it may be impossible to correct the sunken ala with only the sutures described above (Fig. 8 a, b). If this is the case, then using forceps, the lower lateral cartilage can be moved in various directions to find the correct position of the sunken ala. When the best position is found, a few additional pulling sutures should be passed through the inner margin of the alar rim to secure the alar dome in this position.

As mentioned above, these lifting sutures are tied over a bolster on the root of the nose. Of course, the upper lateral cartilage is also undermined at the same time so that its abnormal position may be corrected. It is then secured to the opposite upper cartilage using a tetlon suture subcutaneously (Fig. 9 a, b). Finally, a lateral mattress suture is also tied at the alar base to stop hemorrhaging and to promote healing of the undermined tissue.

Discussion

Patient with cleft lip generally have the following characteristic nasal deformities.

1. Deflection toward the normal side at the nasal tip
2. Downward rotation of the nasal ala
3. Deflection and shortening of the columella
4. Imbalance of the intercrural angle
5. Enlargement of the nostril
6. Depression of the maxilla and attendant anomaly of the alar base
7. Changes in the angle of the conjunctive area between the alar base and the face
8. Deviation of the septal cartilage and the nasal bone

These various nasal deformities and midface deformities are due to underdevelopment of the maxilla. Of course, the deformities of the alar cartilage and septal cartilage will become more severe with growth, and the bony skeleton will also deviate gradually if not corrected early enough. Accordingly, the present authors think that correction of the nasal deformities should be made during secondary correction, when the patient is about 5 years of age, before the deviation of the

septal cartilage become too severe.

In the primary nasal correction, TANGE (1969, 1972) maintained that nasal growth will interfere with proper nasal development if an external undermining incision is not made during primary surgery. O'CONNER (1963) stated that the nasal problem is an integral part of any cleft lip operation and also felt that reduction of the lip and nostril should be completed during primary surgery. The present authors do not agree. We avoid subcutaneous undermining around the alar cartilage during primary surgery in order to prevent the scar formation. McDOWELL (1966) said that marked deviation of the nose rapidly becomes more obvious at 14 or 15 years of age and can not be routinely prevented by any known method of early repair (although early repair undoubtedly reduces the extent and the frequency of this deformity).

Regarding the reduction of the nostril floor, STENSTRÖM (1966, 1977) and SPIRA (1970) fixed a pulling suture from the alar base to the wall of the opposite septal cartilage. Moreover, they wrapped the entire cartilage with these sutures.

In McCOMB's method of primary lip closure, even enough the alar rim and dome are pulled upward toward the root of the nose, many cases still result in the depression of the alar dome within a few months after the operation. This situation can be remedied in the secondary correction. After the enlargement of the nostril floor has been reduced by modified Z-plasty, the nylon suture is passed through the subcutaneous tissue at the inner margin of the alar rim to correct the fallen and depressed alar cartilage.

Summary

The nasal deformities which accompany the unilateral cleft lip are an essential element in their repair. We have described a method of lifting alar cartilage and the alar dome during secondary nasal correction.

It is very important to make a good nasal floor reduction early as this promotes some degree of spontaneous correction of septal deviation.

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和文抄録

片側唇裂に伴う外鼻変形の修復

岩手医科大学形成外科

奈良 卓, 菊池 正知

片側唇裂に伴う外鼻変形は1次あるいは2次的に修復される。私たちは1次的には、手術侵襲による外鼻皮下への結合組織の増生の回避と、鼻中隔および鼻翼軟骨への損傷をさけることを目的とし消極的方法にあまんじている。このため口唇裂閉鎖後、2次的に一定年齢に達した時点で患側鼻腔底の縮小と、鼻翼軟骨偏位の健常位方向への挙上、移動を行う。すなわち鼻腔

はZ形成による縮小を計り、翼状切開による外鼻皮膚反転を行う。露出した患側鼻翼軟骨の脚移行部を健側脚移行部に繋留するほか、鼻孔縁にかけたナイロン糸を外鼻皮下を通し鼻根部に固定する。上記処理によっても、なお変形が改善されぬ場合にはナイロン糸による変形改善方向への補助牽引固定を行い目的を達する。